Amendments to the Claims

The following listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

- 1. (Previously Presented) An antibody-conjugated enzyme, wherein the antibody recognizes a cell surface antigen on a tumor cell and wherein the enzyme activates a chemotherapeutic agent, wherein the enzyme is human deoxycytidine kinase.
 - 2. (Canceled)
- 3. (Withdrawn) The antibody-conjugated enzyme of claim 1, wherein the human deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 1.
- 4. (Original) The antibody-conjugated enzyme of claim 1, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 5. (Previously Presented) The antibody-conjugated enzyme of claim 4, wherein the modified deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 5.
- 6. (Original) The antibody-conjugated enzyme of claim 1, wherein the antibody recognizes CD33.
- 7. (Original) The antibody-conjugated enzyme of claim 6, wherein the antibody is HuM195.
- 8. (Original) The antibody-conjugated enzyme of claim 1, wherein the tumor cell is a leukemia blast cell.

- 9. (Withdrawn) The antibody-conjugated enzyme of claim 1, wherein the tumor cell is a prostate tumor cell, a breast tumor cell, an ovarian tumor cell, or a colon tumor cell.
- 10. (Withdrawn) The antibody-conjugated enzyme of claim 9, wherein the antibody is Herceptin and the tumor cell is a breast or ovarian tumor cell.
- 11. (Currently Amended) The antibody-conjugated enzyme of <u>claim 1</u> elaim 9, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 12. (Original) The antibody-conjugated enzyme of claim 11, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 13. (Withdrawn) The antibody-conjugated enzyme of claim 9, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the tumor cell is a prostate tumor cell.
- 14. (Withdrawn) The antibody-conjugated enzyme of claim 9, wherein the antibody is immunologically specific for CC49, and the tumor cell is a colorectal tumor cell, an ovarian tumor cell, or a breast tumor cell.
- 15. (Withdrawn) The antibody-conjugated enzyme of claim 14, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 16. (Withdrawn) The antibody-conjugated enzyme of claim 15, wherein the modified deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 5.
- 17. (Withdrawn) A method of reducing, inhibiting or preventing proliferation of a tumor cell, comprising the step of contacting the tumor cell in the presence of a prodrug with an antibody-enzyme conjugate, wherein the enzyme converts the prodrug to

an antiproliferative drug, and wherein the antibody recognizes a cell surface antigen expressed at the cell surface of the tumor cell.

- 18. (Withdrawn) The method of claim 17, wherein the antibody-enzyme conjugate is internalized within the tumor cell and wherein the enzyme can activate the prodrug inside the tumor cell.
- 19. (Withdrawn) The method of claim 17, wherein the antibody-enzyme conjugate binds to an antigen on the tumor cell and wherein the enzyme can activate the prodrug outside the tumor cell.
- 20. (Withdrawn) The method of claim 17, wherein the enzyme is human deoxycytidine kinase.
- 21. (Withdrawn) The method of claim 20, wherein the human deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 1.
- 22. (Withdrawn) The method of claim 17, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 23. (Withdrawn) The antibody-conjugated enzyme of claim 22, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 24. (Withdrawn) The method of claim 17, wherein the antibody recognizes CD33.
 - 25. (Withdrawn) The method of claim 24, wherein the antibody is HuM195.
- 26. (Withdrawn) The method of claim 17, wherein the tumor cell is a leukemia blast cell.
- 27. (Withdrawn) The method of claim 17, wherein the tumor cell is a prostate tumor cell, a breast tumor cell, an ovarian tumor cell, or a colon tumor cell.

- 28. (Withdrawn) The method of claim 27, wherein the antibody is Herceptin and the tumor cell is a breast or ovarian tumor cell.
- 29. (Withdrawn) The method of claim 28, wherein the enzyme is modified human deoxycytidine kinase having an amino acid sequence identified as SEQ ID NO. 5.
- 30. (Withdrawn) The method of claim 23, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the tumor cell is a prostate tumor cell.
- 31. (Withdrawn) The method of claim 26, wherein the enzyme is modified human deoxycytidine kinase having an amino acid sequence identified as SEQ ID NO. 5.
- 32. The method of claim 23, wherein the antibody is immunologically specific for CC49, and the tumor cell is a colorectal tumor cell, an ovarian tumor cell, or a breast tumor cell.
- 33. (Withdrawn) The method of claim 27, wherein the enzyme is modified human deoxycytidine kinase having an enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 34. (Withdrawn) The antibody-conjugated enzyme of claim 33, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 35. (Withdrawn) A method of reducing drug-resistance in a cancer patient comprising the steps of:
 - a. providing an enzyme conjugated to an antibody, wherein the enzyme activates
 a drug and wherein the antibody is specific for a cell surface antigen present
 on a tumor cell;
- b. administering the antibody-conjugated enzyme of step (a) to the patient; and

- c. administering the drug that is activated by the antibody-conjugated enzyme to the patient.
- 36. (Withdrawn) The method of claim 29, wherein the enzyme is a kinase and the drug is a chemotherapeutic agent.
- 37. (Withdrawn) The method of claim 30, wherein the kinase is deoxycytidine kinase and the chemotherapeutic agent is a nucleoside analog.
- 38. (Withdrawn) The method of claim 35, wherein the enzyme is human deoxycytidine kinase.
- 39. (Withdrawn) The antibody-conjugated enzyme of claim 38, wherein the human deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 1.
- 40. (Withdrawn) The antibody-conjugated enzyme of claim 35, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 41. (Withdrawn) The antibody-conjugated enzyme of claim 40, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
 - 42. (Withdrawn) The method of claim 35, wherein the antibody is HuM195.
 - 43. (Withdrawn) The method of claim 35, wherein the cancer is leukemia.
- 44. (Withdrawn) The method of claim 35, wherein the cancer is breast cancer, prostate cancer, ovarian cancer, or colon cancer.
- 45. (Withdrawn) The method of claim 35, wherein the antibody is Herceptin and the tumor cell is a breast or ovarian tumor cell.
- 46. (Withdrawn) The method of claim 45, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.

- 47. (Withdrawn) The antibody-conjugated enzyme of claim 46, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 48. (Withdrawn) The method of claim 35, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the tumor cell is a prostate tumor cell.
- 49. (Withdrawn) The method of claim 48, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 50. (Withdrawn) The antibody-conjugated enzyme of claim 49, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 51. (Withdrawn) The method of claim 35, wherein the antibody is immunologically specific for CC49, and the tumor cell is a colorectal tumor cell, an ovarian tumor cell, or a breast tumor cell.
- 52. (Withdrawn) The method of claim 51, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 53. (Withdrawn) The antibody-conjugated enzyme of claim 52, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 54. (Withdrawn) A method of treating a cancer patient comprising the steps of:
- a. administering the antibody-conjugated enzyme of claim 1 to the patient; and
 - b. administering a chemotherapeutic agent to the patient.
- 55. (Withdrawn) The method of claim 54, wherein the chemotherapeutic agent is a nucleoside analog.

- 56. (Withdrawn) The method of claim 54, wherein the cancer is leukemia.
- 57. (Withdrawn) The method of claim 56, wherein the enzyme is a modified deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 58. (Withdrawn) The antibody-conjugated enzyme of claim 57, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 59. (Withdrawn) The method of claim 54, wherein the cancer is breast cancer, prostate cancer, ovarian cancer, or colon cancer.
- 60. (Withdrawn) The method of claim 54, wherein the antibody is Herceptin and the cancer a breast or ovarian cancer.
- 61. (Withdrawn) The method of claim 60, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 62. (Withdrawn) The antibody-conjugated enzyme of claim 61, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 63. (Withdrawn) The method of claim 54, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the cancer is prostate cancer.
- 64. (Withdrawn) The method of claim 63, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 65. (Withdrawn) The antibody-conjugated enzyme of claim 64, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.

- 66. (Withdrawn) The method of claim 54, wherein the antibody is immunologically specific for CC49, and the cancer is colorectal cancer, ovarian cancer, or breast cancer.
- 67. (Withdrawn) The method of claim 66, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 68. (Withdrawn) The antibody-conjugated enzyme of claim 67, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 69. (Original) A pharmaceutical composition comprising the antibodyconjugated enzyme of claim 1 and a pharmaceutical acceptable carrier.
- 70. (Withdrawn) A method of treating a cancer patient comprising the steps of:
- a. administering the pharmaceutical composition of claim 69 to the patient; and
 - b. administering a chemotherapeutic agent to the patient.
- 71. (Withdrawn) The method of claim 70, wherein the chemotherapeutic agent is a nucleoside analog.
 - 72. (Withdrawn) The method of claim 70, wherein the cancer is leukemia.
- 73. (Withdrawn) The method of claim 72, wherein the enzyme is a modified deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 74. (Withdrawn) The antibody-conjugated enzyme of claim 73, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 75. (Withdrawn) The method of claim 70, wherein the cancer is breast cancer, prostate cancer, ovarian cancer, or colon cancer.

- 76. (Withdrawn) The method of claim 75 wherein the antibody is Herceptin and the cancer a breast or ovarian cancer.
- 77. (Withdrawn) The method of claim 76, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 78. (Withdrawn) The antibody-conjugated enzyme of claim 77, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 79. (Withdrawn) The method of claim 70, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the cancer is prostate cancer.
- 80. (Withdrawn) The method of claim 79, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 81. (Withdrawn) The antibody-conjugated enzyme of claim 80, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 82. (Withdrawn) The method of claim 70, wherein the antibody is immunologically specific for CC49, and the cancer is colorectal cancer, ovarian cancer, or breast cancer.
- 83. (Withdrawn) The method of claim 82, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 84. (Withdrawn) The antibody-conjugated enzyme of claim 83, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 85. (Withdrawn) A method of increasing the efficacy of a chemotherapeutic agent in a cancer patient, the method comprising the steps of:

- a. providing an enzyme conjugated to an antibody, wherein the enzyme activates the chemotherapeutic agent and wherein the antibody is specific for a cell surface antigen present on a tumor cell;
- b. administering the antibody-conjugated enzyme of step (a) to the patient; and
- c. administering the chemotherapeutic agent that is activated by the antibody-conjugated enzyme to the patient.
- 86. (Withdrawn) The method of claim 85, wherein the enzyme is a kinase and the chemotherapeutic agent is a nucleoside analog.
- 87. (Withdrawn) The antibody-conjugated enzyme of claim 85, wherein the enzyme is human deoxycytidine kinase.
- 88. (Withdrawn) The antibody-conjugated enzyme of claim 87, wherein the human deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 1.
- 89. (Withdrawn) The antibody-conjugated enzyme of claim 85, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 90. (Withdrawn) The antibody-conjugated enzyme of claim 89, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
 - 91. (Withdrawn) The method of claim 85, wherein the antibody is HuM195.
 - 92. (Withdrawn) The method of claim 85, wherein the cancer is leukemia.
- 93. (Withdrawn) The method of claim 85, wherein the enzyme is a modified deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.

- 94. (Withdrawn) The antibody-conjugated enzyme of claim 93, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 95. (Withdrawn) The method of claim 85, wherein the cancer is breast cancer, prostate cancer, ovarian cancer, or colon cancer.
- 96. (Withdrawn) The method of claim 85, wherein the antibody is Herceptin and the cancer a breast or ovarian cancer.
- 97. (Withdrawn) The method of claim 96, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 98. (Withdrawn) The antibody-conjugated enzyme of claim 97, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 99. (Withdrawn) The method of claim 85, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the cancer is prostate cancer.
- 100. (Withdrawn) The method of claim 99, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 101. (Withdrawn) The antibody-conjugated enzyme of claim 100, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 102. (Withdrawn) The method of claim 85, wherein the antibody is immunologically specific for CC49, and the cancer is colorectal cancer, ovarian cancer, or breast cancer.
- 103. (Withdrawn) The method of claim 102, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.

- 104. (Withdrawn) The antibody-conjugated enzyme of claim 104, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 105. (Withdrawn) A method of treating a cancer patient comprising the steps of:
- a. providing a kinase conjugated to an antibody, wherein the kinase activates a chemotherapeutic agent and wherein the antibody is specific for a cell surface antigen present on a tumor cell;
 - b. administering the antibody-conjugated kinase of step (a) to the patient; and
 - c. administering the chemotherapeutic agent to the patient.
- 106. (Withdrawn) The method of claim 105, wherein the kinase is deoxycytidine kinase and the chemotherapeutic agent is a nucleoside analog.
- 107. (Withdrawn) The antibody-conjugated enzyme of claim 106, wherein the enzyme is human deoxycytidine kinase.
- 108. (Withdrawn) The antibody-conjugated enzyme of claim 107, wherein the human deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 1.
- 109. (Withdrawn) The method of claim 105, wherein the deoxycytidine kinase is a modified deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 110. (Withdrawn) The antibody-conjugated enzyme of claim 109, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
 - 111. (Withdrawn) The method of claim 105, wherein the antibody is HuM195.
 - 112. (Withdrawn) The method of claim 105, wherein the cancer is leukemia.

- 113. (Withdrawn) The method of claim 112, wherein the enzyme is a modified deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 114. (Withdrawn) The antibody-conjugated enzyme of claim 113, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 115. (Withdrawn) The method of claim 105, wherein the cancer is breast cancer, prostate cancer, ovarian cancer, or colon cancer.
- 116. (Withdrawn) The method of claim 105 wherein the antibody is Herceptin and the cancer a breast or ovarian cancer.
- 117. (Withdrawn) The method of claim 116, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 118. (Withdrawn) The antibody-conjugated enzyme of claim 117, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 119. (Withdrawn) The method of claim 105, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the cancer is prostate cancer.
- 120. (Withdrawn) The method of claim 119, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 121. (Withdrawn) The antibody-conjugated enzyme of claim 120, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 122. (Withdrawn) The method of claim 105, wherein the antibody is immunologically specific for CC49, and the cancer is colorectal cancer, ovarian cancer, or breast cancer.

- 123. (Withdrawn) The method of claim 122, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 124. (Withdrawn) The antibody-conjugated enzyme of claim 123, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 125. (Withdrawn) A method of overcoming chemotherapeutic drug resistance in a cancer patient, comprising the steps of:
- a. providing a enzyme conjugated to an antibody, wherein the enzyme activates a chemotherapeutic agent and wherein the antibody is specific for a cell surface antigen present on a tumor cell;
- b. administering the antibody-conjugated enzyme of step (a) to the patient; and
 - c. administering the chemotherapeutic agent to the patient.
 - 126. (Withdrawn) The method of claim 125, wherein the enzyme is a kinase.
- 127. (Withdrawn) The method of claim 126, wherein the kinase is deoxycytidine kinase and the chemotherapeutic agent is a nucleoside analog.
- 128. (Withdrawn) The antibody-conjugated enzyme of claim 126, wherein the deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 1.
- 129. (Withdrawn) The antibody-conjugated enzyme of claim 125, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 130. (Withdrawn) The antibody-conjugated enzyme of claim 129, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
 - 131. (Withdrawn) The method of claim 129, wherein the antibody is HuM195.

- 132. (Withdrawn) The method of claim 129, wherein the cancer is leukemia.
- 133. (Withdrawn) The method of claim 132, wherein the enzyme is a modified deoxycytidine kinase, having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 134. (Withdrawn) The antibody-conjugated enzyme of claim 133, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 135. (Withdrawn) The method of claim 129, wherein the cancer is breast cancer, prostate cancer, ovarian cancer, or colon cancer.
- 136. (Withdrawn) The method of claim 129 wherein the antibody is Herceptin and the cancer a breast or ovarian cancer.
- 137. (Withdrawn) The method of claim 136, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 138. (Withdrawn) The antibody-conjugated enzyme of claim 137, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 139. (Withdrawn) The method of claim 129, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the cancer is prostate cancer.
- 140. (Withdrawn) The method of claim 139, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 141. (Withdrawn) The antibody-conjugated enzyme of claim 140, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.

- 142. (Withdrawn) The method of claim 129, wherein the antibody is immunologically specific for CC49, and the cancer is colorectal cancer, ovarian cancer, or breast cancer.
- 143. (Withdrawn) The method of claim 142, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 144. (Withdrawn) The antibody-conjugated enzyme of claim 133, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 145. (Withdrawn) A method of overcoming chemotherapeutic drug resistance in a tumor cell, comprising the steps of:
- a. providing a enzyme conjugated to an antibody, wherein the enzyme activates a chemotherapeutic agent and wherein the antibody is specific for a cell surface antigen present on a tumor cell; and
- b. contacting the tumor cell with the antibody-conjugated enzyme of step (a) to the patient.
 - 146. (Withdrawn) The method of claim 145, wherein the enzyme is a kinase.
- 147. (Withdrawn) The method of claim 146, wherein the kinase is deoxycytidine kinase and the chemotherapeutic agent is a nucleoside analog.
- 148. (Withdrawn) The antibody-conjugated enzyme of claim 147, wherein the deoxycytidine kinase has an amino acid sequence identified as SEQ ID NO: 1.
- 149. (Withdrawn) The antibody-conjugated enzyme of claim 145, wherein the enzyme is a modified deoxycytidine kinase, wherein the modified deoxycytidine kinase has enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.

- 150. (Withdrawn) The antibody-conjugated enzyme of claim 149, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
 - 151. (Withdrawn) The method of claim 145, wherein the antibody is HuM195.
- 152. (Withdrawn) The method of claim 145, wherein the tumor cell is a leukemia blast cell.
- 153. (Withdrawn) The method of claim 152, wherein the enzyme is a modified deoxycytidine kinase, having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 154. (Withdrawn) The antibody-conjugated enzyme of claim 153, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5
- 155. (Withdrawn) The method of claim 145, wherein the tumor cell is a breast, prostate, colon, or ovarian.
- 156. (Withdrawn) The method of claim 145, wherein the antibody is Herceptin and the tumor cell is a breast or ovarian tumor cell.
- 157. (Withdrawn) The method of claim 156, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 158. (Withdrawn) The antibody-conjugated enzyme of claim 157, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 159. (Withdrawn) The method of claim 145, wherein the antibody is immunologically specific for six-transmembrane epithelial antigen of the prostate, and the tumor cell is a prostate tumor cell.
- 160. (Withdrawn) The method of claim 159, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.

- 161. (Withdrawn) The antibody-conjugated enzyme of claim 160, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 162. (Withdrawn) The method of claim 145, wherein the antibody is immunologically specific for CC49, and the tumor cell is a colorectal tumor cell, an ovarian tumor cell, or a breast tumor cell.
- 163. (Withdrawn) The method of claim 162, wherein the enzyme is modified human deoxycytidine kinase having enhanced activity towards nucleoside analogs compared with wild type deoxyctidine kinase.
- 164. (Withdrawn) The antibody-conjugated enzyme of claim 163, wherein the modified deoxycytidine kinase has an animo acid sequence identified as SEQ ID NO: 5.
- 165. (Withdrawn) A modified deoxycytidine kinase having an animo acid sequence identified as SEQ ID NO. 5.
- 166. (Withdrawn) An isolated polynucleotide encoding the modified deoxycytidine kinase of claim 165.
- 167. (Withdrawn) An expression vector comprising the polynucleotide of claim 166.
 - 168. (Withdrawn) A host cell comprising the expression vector of claim 167.
- 169. (Withdrawn) A method of making a modified deoxycytidine kinase having an animo acid sequence identified as SEQ ID NO. 5, the method comprising the steps of:
- a) culturing the host cell of claim 168 under conditions whereby the kinase is expressed; and
 - b) purifying the antagonist from the host cell culture.